QUIZ #6 – Solutions
Each problem is worth 5 points

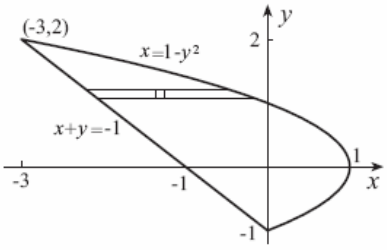
15 points total

1.

$$\int_{-1}^{1}\int_{1}^{e}\frac{y}{x}\,dx\,dy=\int_{-1}^{1}\Big\{y\ln|x|\Big\}_{1}^{e}dy=\int_{-1}^{1}y\,dy=\left\{\frac{y^2}{2}\right\}_{-1}^{1}=0$$

2.

$$\begin{aligned}\iint_R xy^2\,dA&=\int_{-1}^{2}\int_{-1-y}^{1-y^2}xy^2\,dx\,dy=\int_{-1}^{2}\left\{\frac{x^2y^2}{2}\right\}_{-1-y}^{1-y^2}dy\\&=\frac{1}{2}\int_{-1}^{2}(y^6-3y^4-2y^3)\,dy\\&=\frac{1}{2}\left\{\frac{y^7}{7}-\frac{3y^5}{5}-\frac{y^4}{2}\right\}_{-1}^{2}=-\frac{621}{140}\end{aligned}$$



3.

$$\begin{aligned}\int_0^1\int_y^1\sin x^2\,dx\,dy&=\int_0^1\int_0^x\sin x^2\,dy\,dx=\int_0^1\Big\{y\sin x^2\Big\}_0^x dx\\&=\int_0^1 x\sin x^2\,dx\\&=\left\{-\frac{\cos x^2}{2}\right\}_0^1=\frac{1-\cos 1}{2}\end{aligned}$$